causes to hamper the supply through import of the raw-materials required by the atomic power plants in India;

(b) if so, what are the alternative proposals of Government to meet the requirement of raw-materials for the atomic power plants in the country in case the present supply channels are stopped by foreign powers;

(c) what is the total power generated by each of the atomic power plants in India during the year 1991-92 and what is the proportionate share of the power generated and supplied from the atomic power plants to the Indian grid of electric power during the year 1991-92; and

(d) whether the share of contribution to the total grid of power is increasing or decreasing ?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE & TECHNOLOGY, DEPARTMENT OF ELECTRONICS AND DEPARTMENT OF OCEAN DEVELOPMENT AND MINISTER OF STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS (SHRI P. R. KUMARAMANGALAM) : (a) and (b) There have been difficulties in importing raw materials and components for Atomic Power Plants on account of the country's insistence on a non-discriminatory Non-Proliferation Treaty. This has, however, accelerated the development of indigenous technology for the nuclear power plants. India's nuclear power programme is based essentially on Pressurised Heavy Water Reactor (PHWR) technology using indigenous natural uranium as fuel. The exception is the Tarapur Atomic Power Station. The import content in a PHWR is only 15%, which could also be indigenised. Light enriched uranium fuel for the Tarapur Atomic Power Station is being supplied by France under an agreement which is valid till October, 1993. In case there are difficulties in the continued supply of fuel from France, indigenous material and technology are available for the continued operation of the plant.

(c) Total power generated from Atomic Power Stations during the period 1-4-91 to 31-3-1992 is as follows :—

Unit	Gross generation in Million Units (Million kilo-watt hrs.)
Tarapur-1	745
Tarapur-2	965
Rajasthan	123
Rajasthan-2	1062
Madras-1	869
Madras-2	1292
Narora-1	532

The electrical energy produced by the nuclear power plants during 1991-92 is about 2% of the total electrical energy produced in the country during this period.

(d) The share of electricity expressed as a percentage of the total electricity generated in the country has generally remained the same in the past two to three years.

Recovery of Uranium 233 From Thorium Deposits

492. SHRI VISHWASRAO RAMRAO PATIL : Will the PRIME MINISTER be pleased to state :

(a) whether Government's attention has been drawn to the recovery of Uranium 233 from Thorium deposits in the country;

(b) if so, the details thereof;

(c) whether Government have any steps in the matter;

(d) if so, the details thereof; and

(e) if not, the reasons therefor ?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE & TECHNOLOGY, DEPARTMENT OF ELECTRONICS AND DEPARTMENT OF OCEAN DEVELOPMENT AND MINISTER OF STATE IN THE MINISTRY OF PARLIA-

MENTARY AFFAIRS (SHRI P. R. KUMARAMANGALAM) : (a) and (b) Yes, Sir, Thorium in its natural form does not contain any Uranium-233. However, when irradiated in a nuclear reactor, part of Thorium gets converted into Uranium-233 which can be recovered.

(c) to (e) Research and Development towards utilisation of Thorium for energy production is being actively pursued in the Department of Atomic Energy. A small reactor based on Uranium-233 has been built by the Bhabha Atomic Research Centre. The initial core of the first unit of Kakrapar Atomic Power Project has been loaded with Thorium bundles to achieve power flattening.

Achievements of the Atomic Research Institute

493. SHRI TINDIVANAM G. VENKATRAMAN : Will the PRIME MINISTER be pleased to state :

(a) what have been the consolidated achievements of various research institutes of Atomic Energy in the country; and

(b) what are the norms fixed for selection of scientists in Atomic Research Institutes and number of the Scientists of foreign countries employed in these research institutions ?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY, DEPARTMENT OF ELECTRONICS AND DEPARTMENT OF OCEAN DEVELOPMENT AND MINISTER OF STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS (SHRI P. R. KUMARAMANGALAM) : (a) From the early 50s with the setting up of Atomic Energy Establishment, Trombay, India has been able to develop the full fuel cycle. The Atomic Research Institutes have developed indigenous technology from stage of prospecting for uranium and thorium ores, mining of the ores, fabrication of fuel, design, construction and operation of power reactors, reprocessing of spent fuel and waste disposal. A fast breeder test reactor has been commissioned and is being operated. Several use of isotopes and nuclear technology in agriculture, medicine and industry have also been developed. Apart from these, indigenous technologies have been developed in high tech and frontier areas of science, such as lasers, accelerators, high temperature superconductivity, cryogenics, robotics, electronics, computer sciences, genetic engineering and sodium technology. A number of technologies in nuclear and other areas have been transferred to private industry and public sector undertakings.

(b) Scientists and Engineers are selected every year from a large number of First Class M. Sc. Degree holders with not less than 60% marks and Graduate Engineers with not less than 65% marks after a written test and *viva-voce* and given one year orientation course or in-plant training in nuclear sciences and engineering prior to their appointment. From the year 1991-92, M. Tech. Graduates in selected specialised areas are being recruited for placement in various divisions. Some exceptional Ph.Ds. from Indian and Foreign Universities are also recruited after careful consideration on a case-to-case basis. No scientist from any foreign country is employed in any of the research institutes under the Department of Atomic Energy.

ISI Spies in Bare, HP and BP

494. SHRI VIREN J. SHAH : Will the PRIME MINISTER be pleased to state :

(a) whether Government's attention has been drawn to a report which appeared in the Sunday Observer of October 25, 1992 under the caption "Inter-services Intelligence Agency of Pakistan (ISI) Spies in BARC, HP and BP";

(b) if so, what are the details in this regard; and

(c) what preventive action Government have taken to check the objectionable activities of ISI and safeguard our vital atomic installations ?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY, DEPARTMENT OF ELECTRONICS AND DEPARTMENT OF